

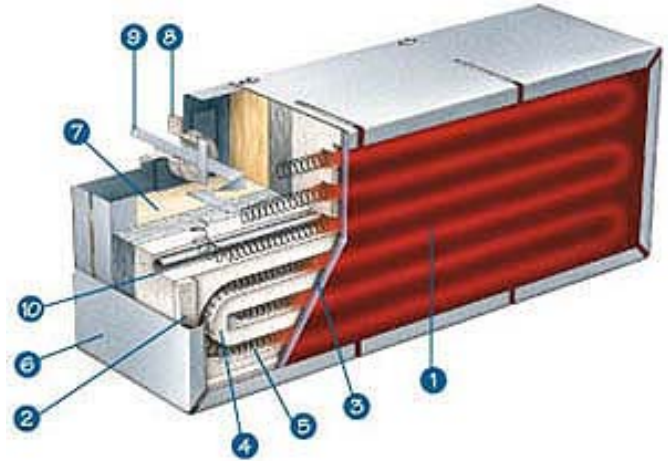
M, G, K Series Panel Heaters

G-Series, M-Series, and K-Series Panel Heaters

Heaters in the G-Series, M-Series, and K-Series product lines use a high-temperature material for their surface face. All heaters provide a uniform coverage with a convenient, cleanable surface.

Features

1. Glass, metal, or koramic emitter surface material
2. Ceramic standoffs used to keep electrically conductive material separated from resistance wire
3. High-temperature cement bond
4. Refractory board to hold resistance wire
5. Precision-resistance wire
6. Heavy gauge aluminized steel frame
7. Blanket insulation layer
8. Ceramic bushings to insulate terminals
9. Stainless steel terminals
10. Quartz thermowell tube (optional)



G-Series Specifications

Glass is the standard face on the G-Series panel heaters. There are two versions of this heater. The GB model makes use of a high-temperature (1202°F/ 650°C, continuously operating temperature) black glass, while the GC heater makes use of a clear (slight yellow tint), high-temperature (1292°F/700°C, continuously operating temperature) glass. The remaining construction of the G-Series heater is similar to that of the F-Series heater with the exception that glass replaces the quartz composite fabric as the face material.

The glass face G-Series heater is used for industrial applications in which there is a possibility that materials will fall onto the heater's face. A glass face allows for easy clean-up and prevents damage to the heater or heating element. Common applications for the G-Series heater include operation as the bottom oven in a thermoforming machine and as the bottom heater in a wave solder oven.

The G-Series heater can be constructed as wide as 24" (610 mm) and as long as 36" (914 mm), though not that width and length in the same heater. For example, a 36" (914 mm) long heater is commonly 12" (305 mm) wide. This heater has a maximum watt density of 20 watts/in² (31 kW/m²) and a durability defined by a typical life expectancy of 25,000 hours. It has a high radiant efficiency of 77.5%. Because the heater's design does not depend on an external reflector, the heater maintains a consistently high radiant efficiency over time. The G-Series heat transfer rate for 20 watts/in² (31 kW/m²) is 1.9 Btu/ft²/sec. delivered to the product.

M-Series Specifications

Metal is the standard face on the M-Series panel heaters. The face can be manufactured using either hard-coated aluminum or porcelainized steel. The remaining construction is exactly the same as that used in the G-Series heaters. The heater's face can be provided with air holes for forced airflow, as is done in the FBA's construction.

A metal face is used for industrial applications in which there is a possibility that materials will fall onto the heater's face. Although a metal face heater is more durable than a glass face heater, a disadvantage, however, is that the radiant efficiency of metal is slightly lower than that of glass. Because a glass face heater allows a portion of the infrared energy to transmit through the glass, only a segment of the infrared energy is absorbed by the glass and re-radiated. A metal face heater, on the other hand, absorbs all of the energy and re-radiates it to the process. Especially demanding applications sometimes require a slightly different design that makes use of a hard-coated aluminum face constructed in a cap (pan) style. This design ensures that materials definitely can not penetrate the heater.

The M-Series heater can be constructed as wide as 24" (610 mm) and as long as 48" (1219 mm), though not that width and length in the same heater. For example, a 48" (1219 mm) long heater is commonly 12" (305 mm) wide. This heater has a maximum watt density of 10-15 watts/in² (15.5 - 23 kW/m²), depending on which metal face is used, and a durability defined by a typical life expectancy of 25,000 hours. It has a radiant efficiency of 64%. Because the heater's design does not depend on an external reflector, the heater maintains a consistently high radiant efficiency over time. The M-Series heat transfer rate for 10 watts/in² (15.5 kW/m²) is 0.786 Btu/ft²/sec. delivered to the product.

K-Series Specifications

Koramic is the standard face on the K-Series panel heaters. This face is a ceramic material that offers many advantages. The remaining construction for the K-Series heater is exactly the same as that used in the G-Series heaters. The heater's radiant efficiency is between the glass face and metal face heaters. The koramic face is constructed using interlocking pieces of material in order to enable movement of the heater's face as the heater expands and contracts. This means that the K-Series heater can be constructed for longer lengths than the G-Series heater. Koramic is an approved material for food applications.

The K-Series heater can be constructed as wide as 24" (610 mm) and as long as 60" (1524 mm), though not that width and length in the same heater. For example, a 60" (1524 mm) long heater is commonly 12" (305 mm) wide. This heater has a maximum watt density of 25 watts/in² (39 kW/m²) and a durability defined by a typical life expectancy of 25,000 hours. Because the heater's design does not depend on an external reflector, the heater maintains a consistently high radiant efficiency over time.

Glass Face Warm-up Curve

The warm-up curves are measured from heaters running facedown in open air. The thermocouple is located in a standard location inside a thermowell behind the coil. The curves will change depending on the environment and thermocouple location.

